ORIGINAL

Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554

In the Matter of

Amendment of Section 2.106 of the Commission's Rules to Allocate Spectrum at 2 GHz for Use by the Mobile-Satellite Service	)	ET Docket No. 95-18 RM-7927

To the Commission:

REPLY OF COMSAT CORPORATION

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SUMMARY

COMSAT Corporation ("COMSAT"), through its COMSAT Mobile Communications division, hereby replies to the comments of the mobile satellite service ("MSS"), broadcast and fixed service ("FS") industries concerning the allocation of spectrum at 2 GHz for global MSS systems.

COMSAT, and the MSS industry, fully support the Commission's proposed allocation of 70 MHz of spectrum at 2 GHz to global MSS systems in the paired uplink and downlink bands at 1990-2025 MHz and 2165-2200 MHz. However, COMSAT and other MSS interests have expressed concern regarding the band clearing proposal contained in the NPRM which requires that MSS operators pay an estimated $2.5 billion to relocate existing users in both the uplink and downlink MSS 2 GHz bands. MSS interests also are strongly opposed to the Commission's proposal to auction licenses for MSS spectrum at 2 GHz.

Based on studies COMSAT has conducted, we have proposed that current FS users in the MSS downlink bands need not be relocated in order to allocate usable spectrum for global MSS at 2 GHz and have shown that the service quality of the existing FS operations will not be adversely affected by our alternative proposal. In addition, we have proposed that the 120 MHz of spectrum currently occupied by the broadcast auxiliary services ("BAS") at 1990-2110 MHz be reduced to a total of 85 MHz by rechannelizing the band and moving to more spectrum efficient digital technologies.

We recognize that the technical issues surrounding our proposal are highly complex and that differences of opinion exist on these issues. We anticipate that the reply comments of the incumbent user groups will warrant careful analysis and further discussion. To facilitate this effort and ensure that the technical discussions are satisfactorily resolved as promptly as possible, we ask that the Commission appoint a neutral facilitator to help coordinate such industry meetings and further discussions over the next several weeks.

TABLE OF CONTENTS

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To the Commission:

REPLY OF COMSAT CORPORATION

COMSAT Corporation ("COMSAT"), through its COMSAT Mobile Communications division, hereby submits its Reply to the comments filed on May 5, 1995, in response to the Commission's Notice of Proposed Rule Making ("NPRM") to allocate spectrum at 2 GHz for use by the mobile satellite service ("MSS").[1]

I. INTRODUCTION

In the NPRM, the Commission is proposing to allocate a total of 70 MHz of spectrum at 2 GHz to global MSS systems in the paired uplink and downlink bands at 1990-2025 MHz and 2165-2200 MHz. COMSAT fully supports this spectrum allocation proposal and is encouraged by the comments received thus far in this proceeding which indicate that a majority of the incumbent users do not oppose the proposed 70 MHz allocation for MSS. This allocation is vital to the successful implementation of mobile satellite systems, such as the planned I-CO Global Communications, Ltd. ("I-CO") system in which COMSAT is an investor, which will provide advanced mobile satellite services to domestic and international markets.

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[1] Notice of Proposed Rule Making, ET Docket No. 95-18, released January 31, 1995, ("NPRM").

In the comments filed in this proceeding, COMSAT and other MSS interests expressed concern regarding the band clearing proposal contained in the NPRM which requires that MSS operators pay an estimated $2.5 billion to relocate existing users in both the uplink and downlink MSS 2 GHz bands.[2] Strong opposition also was voiced to the use of auctions to award licenses for global MSS systems at 2 GHz. MSS interests emphasized the need to avoid mutually exclusivity through alternative engineering solutions.

As an alternative, we proposed a two-phased plan in which fixed stations ("FS") operating in the private operational fixed ("POF") bands (at 2180-2200 MHz/2130-2150 MHz) and in the common carrier ("CC") bands (at 2160-2180 MHz/2110-2130 MHz) would remain in their current band allocations and share spectrum with MSS downlinks. Based on studies conducted by COMSAT and COMSAT Laboratories ("COMSAT Labs"), we are convinced that current users in the MSS downlink bands need not be relocated in order to allocate usable spectrum for global MSS at 2 GHz and that the service quality of the existing fixed operations will not be adversely affected by our alternative proposal. In addition, we proposed that the 120 MHz of spectrum currently occupied by the broadcast auxiliary services ("BAS") at 1990-2110 MHz be reduced to a total of 85 MHz by rechannelizing the band and moving to more spectrum efficient digital technologies.

Since filing our Comments, we have met, or talked, on several occasions with industry representatives for the incumbent "downlink"

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[2] See, e.g., Comments of COMSAT, ET Docket No. 95-18, filed May 5, 1995.

terrestrial users to discuss our proposal and the technical studies which support it and believe we have thereby narrowed the issues involved. We also have had what we view as "constructive" discussions with the broadcast industry, and those will continue. However, we recognize that the technical issues surrounding our proposal are highly complex and that differences of opinion exist on these issues. We anticipate that the reply comments of the incumbent user groups will warrant careful analysis and further discussion. To facilitate this effort and ensure that the technical discussions are satisfactorily resolved as promptly as possible, we ask that the Commission appoint a neutral facilitator to help coordinate such industry meetings and further discussions over the next several weeks.

We realize that the issues raised in this proceeding are directly related to the items on the agenda for the 1995 World Radio Conference ("WRC-95") which will take place in Geneva in October. In the Final Report preparing for the Conference, the Commission has maintained strong support for MSS systems at 2 GHz and has clearly stated its intention to obtain additional spectrum for MSS consistent with its proposals in this proceeding.[3] Given the relatively short amount of time before the Conference, we believe that it is imperative to resolve the technical and regulatory issues identified in this proceeding as soon as possible, so that the United States can go to WRC-95 with a comprehensive plan that addresses domestic concerns and

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[3]Report in preparation for ITU World Radiocommunication Conferences, IC Docket No. 94-31, released June 15, 1995 ("WRC-95 Final Report").

facilitates a global solution for 2 GHz MSS systems. COMSAT will do everything possible in support of this objective.

II. THERE IS NO NEED FOR GLOBAL MSS SYSTEMS TO RELOCATE FS SYSTEMS CURRENTLY OPERATING IN THE U.S. AT 2 GHZ

As we indicated in our Comments, COMSAT firmly believes that MSS can share downlink spectrum at 2165-2200 MHz with existing FS operations in the United States without causing harmful interference to the existing FS systems operating in the 2 GHz band. Our conclusion is based on detailed computer simulations conducted by COMSAT Labs, which were summarized in Appendix II to our Comments. Based on the results of these extensive simulation studies, we are confident that it is not necessary to relocate the existing POF and CC microwave installations in the paired bands at 2180-2200 MHz/2130-2150 MHz and 2160-2180 MHz/2110-2130 MHz, respectively, as proposed in the NPRM, in order to accommodate global MSS systems at 2 GHz.

Because the response of the industries affected by our proposal has yet to be entered on the record of this proceeding, we are not in a position to answer any substantive issues regarding our proposal at this time. However, we will attempt in this Reply to clarify certain aspects of our interference simulation model and to address the financial and regulatory issues raised in the Comments regarding the Commission's relocation proposal. After the Replies are submitted, we intend to promptly develop and seek leave to file supplemental

comments which will respond to any substantive, technical concerns regarding our alternative plan.

A. MSS/FS Interference Studies

In devising the MSS/FS interference simulation, COMSAT sought to determine the effects of interference from the I-CO Global spacecraft operating in the MSS bands at 2160-2200 MHz into the FS receiving stations operating in the POF and CC bands at 2180-2200 MHz and 2160-2180 MHz, respectively. While the MSS spacecraft utilized in the simulation is based on the technical design of the I-CO system which employs TDMA technology, we do not believe that a different non-GSO MSS spacecraft design, or access methodology, will alter the results significantly for non-GSO MSS which generate same or lower pfd levels. To confirm that our simulation results extend to other MSS systems, COMSAT is prepared to share our simulation package (executable), with other MSS proponents so that they can perform specific interference analyses for their particular MSS system.

The FS stations described in our interference model are derived from the Commission's Enhanced Microwave Environmental Link File database. Simulations were run using single hop FS systems and multi hop systems consisting of 3-4 microwave links, as well as a long haul multi-hop system containing 20 separate links. The simulation program was configured to assume a "worst case" downlink interference situation, in order to provide conservative results. We recognize that the simulation effort involves complex technical issues and that differences of opinion may arise and warrant careful exploration. To the extent that the FS industry questions the simulation data, or any

other aspect of our technical proposal, COMSAT is prepared to demonstrate the computer simulation program to the FS industry's technical experts, as well as those at the Commission, and to test other, reasonable FS station parameters.[4]

From the detailed simulation studies performed to date, we are convinced that the typical microwave receive stations operating in the United States today in the POF band at 2180-2200 MHz and in the CC band at 2160-2180 MHz can continue their operations without suffering unacceptable levels of performance from I-CO MSS downlink emissions. This is true even when one or more of the satellite MSS carriers are co-channel with the microwave carriers being received by the FS stations. Our extensive simulation data show that while satellite interference may equal, or even exceed on occasion, the thermal noise levels at the microwave receive stations, the throughput levels are so high that allowable FS performance is still achieved. See Comments of COMSAT, Appendix II.

The reverse is not true. COMSAT readily acknowledges that the I-CO MSS handheld receivers operating in the 2170-2200 MHz band could not function in the presence of co-channel microwave carriers, or even only one such carrier, operating from a nearby location. To assist in

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[4]Loral has suggested that the Commission convene a Federal Advisory Committee to analyze technical issues related to frequency migration and provide information on a transition plan. Comments of Loral at 12-16. While the suggestion is a useful one, we believe it is imperative that the Commission resolve the technical and regulatory issues raised in this docket on a timely basis and are concerned that it could take considerable time to approve and form a Federal Advisory Committee. Accordingly, we propose that the Commission simply instruct the parties to meet and that it appoint a neutral "facilitator" from the Commission to help coordinate these technical discussions.

avoiding the interference produced by FS carriers, frequency diversity has been included in the design of the I-CO system. Consequently, when the I-CO handset cannot detect the satellite downlink assigned to it (by call initiation process), it will switch to a second carrier frequency. The alternative downlink carrier will be transmitted by a second satellite illuminating the same service area where the handheld user is located.

The I-CO system is designed to utilize 10 satellites in a two-plane, intermediate circular orbit which permits every service area cell to be illuminated by at least two, and sometimes three, satellites. The second, or third satellite, always employs a non-adjacent frequency to service the cell seen by the first satellite and provide for interference-free transmission to the I-CO handset. More distant microwave stations, which could potentially interfere with the second satellite carrier, will not be a problem for the local I-CO handset, because the inverse-square propagation losses (and terrain/horizon losses) will reduce the noise level to well below that of the satellite downlink carrier. Further detailed study is needed in this respect.

We note also the efforts underway within the ITU to study the effects of MSS/FS interference on a global basis. Studies conducted by ITU-R Task Group 2/2 have concluded that co-channel sharing between non-GSO MSS systems and existing FS systems in the 2 GHz MSS downlink bands at 2160-2200 MHz would generally be feasible in the short to medium time frame, when MSS requirements are fairly modest.[5] In the

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[5]See TG 2/2 Doc. CPM 95/118.

medium to long term, as MSS traffic and spectrum requirements build, sharing is likely to become more difficult. Thus, as we noted in our Comments in the WRC-95 proceeding, it will be necessary to implement an international transition plan which will preclude new operations in the MSS downlink bands and eventually clear FS operations in these bands over the long term.[6]

The WRC-95 2 GHz Transition Ad Hoc Working Group is currently reviewing possible U.S. positions for global FS transitional arrangements as part of the on-going preparation for WRC-95. COMSAT believes that similar transition issues also need to be addressed on the domestic front, as part of this proceeding.

B. With the Exception of a Freeze on New Licenses, the Relocation Procedures Employed for PCS Are Not Appropriate for MSS Systems at 2 GHZ

In contrast to the comments of the FS industry which advocated strict adherence to the Commission's relocation policies,[7] MSS interests indicated grave concern for the high cost and the complex procedures involved in relocating FS systems which currently operate in the MSS downlink bands at 2160-2200 MHz.[8] Based on the findings of the WRC-95 2 GHz Transition Ad Hoc Working Group, and the information

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[6]Comments of COMSAT Mobile Communications, IC Docket No. 94-31, filed March 6, 1995. Given the findings of Task Group 2/2, and our own simulation studies, we strongly disagree with Motorola's cursory dismissal of MSS/FS sharing prospects. See Comments of Motorola at 15-18.

[7]See Comments of UTC at 2-4; API at 12-14; APCO at 2-3; AAR at 2-5.

[8]Comments of Loral at 16-20; PCSAT at 6-11; TRW at 5-18; Motorola at 22; COMSAT at 10-17.

provided by the various terrestrial and satellite interests which participated in the group, it is clear that the costs to relocate just the FS systems currently operating in the paired bands at 2 GHz would likely exceed $2.5 billion. Comments of COMSAT at 11-15. The MSS parties which commented on this cost estimate noted that, in combination with the substantial system development costs for MSS, any requirement that MSS pay to relocate incumbent FS systems would deal a serious blow to the development of the MSS industry, both domestically and internationally. See, e.g., Comments of PCSAT at 6-11.

MSS interests also commented that the involuntary relocation procedures adopted for PCS are not appropriate or feasible in the context of MSS. See, e.g., Comments of Loral at 16-20. As Loral pointed out, MSS spectrum will not be awarded in discrete geographic parcels so that the FS displacement cost could be apportioned to a single MSS provider. See Comments of Loral at 16-17. Also, it is unclear how relocation costs would be divided among different MSS licensees which may hold different amounts of spectrum and may enter the market at different times. Loral also notes the hardship that would result in planning satellite launch dates if the Commission permits reverse migration of FS stations within the first year after relocation. See id. at 19-20.

Indeed, the only aspect of the Commission's involuntary relocation process which makes sense in the context of MSS licensing is the need to impose a freeze on new construction by existing services in the affected bands. Loral has requested that the Commission accept no applications for new licenses for operation on a

primary basis in the 1990-2025 MHz MSS uplink bands and in the 2165-2200 MHz MSS downlink bands after the adoption of an Order in this proceeding. Comments of Loral at 10. This proposal is consistent with the procedures adopted in the Emerging Technology docket.[9] Accordingly, we propose that the Commission, upon the adoption of an Order in this proceeding which allocates 2 GHz spectrum to MSS, immediately impose a freeze on issuing new licenses to terrestrial systems now occupying both the proposed MSS downlink and uplink bands.

III. BROADCAST AUXILIARY OPERATIONS SHOULD NOT BE RELOCATED TO ADJACENT 2 GHZ SPECTRUM, BUT SHOULD REDUCE THEIR BAS SPECTRUM REQUIREMENTS IN ANTICIPATION OF THE TRANSITION TO DIGITAL

From the comments it is apparent that the MSS industry generally agrees with the Commission that MSS cannot share spectrum in the proposed uplink bands at 1990-2025 MHz with existing broadcast auxiliary service ("BAS") operations in the 1990-2110 MHz band.[10] While two MSS proponents note that the Commission has not conducted any studies in this proceeding to support its conclusion,[11] COMSAT believes that the study conducted by COMSAT Labs, as described in Appendix I of our Comments, demonstrates the impracticality of MSS/BAS band sharing. As stated in our Comments, our analysis indicates that

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[9] See First Report and Order (ET Docket No. 92-9), 7 FCC Rcd 6886, 6886-86 (1992).

[10] See Comments of Motorola at 15; Comments of TRW at 8; Comments of Celsat at 8; Comments of COMSAT at 8-10.

[11] See Comments of Loral at 14; Comments of Constellation at 3.

U.S. electronic news gathering ("ENG") transmissions will overwhelm MSS uplinks and compromise the MSS transmission with unacceptable levels of interference. Comments of COMSAT at 9. Thus, COMSAT fully supports the Commission's premise that BAS operations will have to be cleared out of any 2 GHz bands allocated to MSS uplinks.

A majority of the MSS industry also support the Commission's alternative proposal that BAS operations should become more spectrally efficient and use only the remaining 85 MHz of bandwidth between 2025-2110 MHz for their ENG operations.[12] We indicated in our Comments that it was vitally important for the Commission to make an immediate allocation of at least a portion of the 1990-2010 MHz band for global MSS uplinks consistent with the international allocation for global MSS made at WARC-92. We argued that any further reduction of the BAS band could take place over a more extended period of time to take advantage of the advances in digital technology and the broadcasters natural migration to more spectrum efficient technologies. Comments of COMSAT at 22-24. A somewhat different alternative proposed by Motorola suggests that the Commission gradually relocate the entire 120 MHz BAS band to spectrum above 2 GHz where more spectrally efficient digital compression technologies could be employed. See Comments of Motorola at 19.

The alternative proposals offered by the MSS industry are driven by the common belief that the costs to relocate BAS to the 2025-2145 MHz band, and the resulting relocation of the paired FS facilities

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[12] See Comments of TRW at 11; Constellation at 3; Loral at 14-15; Celsat at 7; COMSAT at 18-24.

currently occupying the 2 GHz bands, are so overwhelming that global MSS would not be able to go forward at 2 GHz if MSS licensees are forced to pay all BAS/FS relocation costs. As many of the MSS parties noted, based on the cost data derived from the WRC-95 2 GHz Transition Ad Hoc Working Group, the combined BAS/FS relocation costs are likely to exceed $2.5 billion and could easily approach $3.0 billion. Given the staggering cost of the combined BAS/FS relocation, and the continuing advances in digital compression technology, the MSS community appears to believe that the better approach is to avoid relocating BAS to the adjacent 2 GHz bands and to ensure that the broadcasters make more efficient use of the spectrum they currently occupy.

In this regard, we are pleased to note that the Society of Broadcast Engineers ("SBE") believes it would be possible to narrow the bandwidth of the channels currently used for BAS to 15 MHz and still maintain signal quality sufficient for contribution quality video links. See Comments of SBE at 8. COMSAT Labs has conducted an experimental laboratory evaluation of an FM link operating under these conditions and has confirmed SBE's contention. The results, shown in the attached Tables 1 and 2, demonstrate performance levels sufficient for contribution quality links in a BAS channel bandwidth of 15 MHz.[13] Under SBE's alternative plan, 14 MHz of spectrum, thus, would be cleared for MSS uplinks.

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[13]The attached Tables 1 and 2 include data for a 15 MHz bandwidth BAS channel as an addition to the data previously shown in Appendix III to COMSAT's Comments.

Based on our further consideration of the issues and comments filed, COMSAT urges the Commission to immediately clear up to 20 MHz of BAS spectrum for global MSS uplinks between 1990-2010 MHz. This allocation should be sufficient to accommodate the initial requirements of several global MSS systems and would be consistent with the WARC-2 global MSS allocation at 2 GHz. Accordingly, global MSS systems, such as I-CO, which are intending to operate first generation satellites at 2 GHz to provide personal mobile satellite services, will at least have sufficient spectrum to commence operations before the year 2000, if WRC-95 advances the date of availability of this spectrum on a global basis. Additional spectrum then could be released from the second BAS channel over time, as MSS operations expand and digital broadcast technology improves and costs decrease, to ensure that MSS uplinks can operate within the full 35 MHz of expanded MSS uplink spectrum at 1990-2025 MHz sometime thereafter.

Contrary to the comments of the broadcast groups, which were unified in their skepticism regarding near term use of digital techniques for BAS applications,[14] COMSAT continues to believe that a gradual transition to digital technology will provide service quality for BAS applications equal to that currently provided by analog FM and will greatly improve the spectral efficiency of BAS operations. SBE, in particular, goes to great length to show that digital is "not yet a solution" for BAS operations. Comments of SBE at 5. However, as

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[14]See Comments of AMSTV at 3-4, 16-18; SBE at 5-6; Creative Broadcast Techniques at 8.

COMSAT noted in our Comments, and as we illustrate further below, improvements in digital video are continuing on a day-by-day basis.

Older video systems which require many megabits of data to provide usable performance are in the process of being replaced by newer systems including those adhering to the recently developed MPEG II standard. For example, satellite Direct-to-Home ("DTH") television transmissions are presently providing high quality television reception to homeowners using bit rates of 3.9 to 5.9 Megabits per Second ("Mbps"). The development of DTH is an indication of the level of sophistication of current digital video technology. While DTH transmission is not sufficient for contribution quality links, which SBE maintains are necessary for ENG operations, the new MPEG II standard will clearly allow contribution quality links with bit rates of less than 20 Mbps corresponding to a BAS channel bandwidth of less than 5 MHz when utilizing high order modulation techniques.

In addition, COMSAT believes that the coupling of state-of-the-art television encoding and decoding equipment with well developed digital transmission techniques will provide broadcasters with better quality links than are presently available with analog systems and also will help to conserve spectrum. Terrestrial microwave relay systems routinely use digital modulation schemes of a very high level (e.g. as high as 256 Quadrature Amplitude Modulation ("QAM")) to carry thousands of telephone conversations on a single link. Moreover, transmission channel imperfections such as multi-path propagation and fading are overcome with sophisticated yet practical techniques such as adaptive equalization and power control. COMSAT

believes that similar encoding/decoding techniques could overcome some of the broadcasters current concerns regarding digital compression technology.[15]

In the case of truly mobile applications, such as shots from sailboats, blimps or race cars, the transmission channel would most likely not support as high a modulation level as 64 QAM. While the use of a more robust format, such as an 8 level Phase Shift Keying modulation scheme, would result in a lower quality picture, it still would provide reproduction comparable to that seen today in mobile situations.

COMSAT is convinced that the size, weight and power consumption of television encoding equipment will continue to decline as the various components become more highly integrated. COMSAT believes that the cost reductions referred to in our Comments are valid, and perhaps conservative. See Comments of COMSAT at 22-23. The reduction in physical size and power consumption should help to promote the replacement of current analog equipment with digital video equipment.

As COMSAT currently conceives its two-phase BAS spectrum reduction proposal, after duly considering the comments filed in this proceeding, we propose that in Phase One the Commission would proceed immediately to clear up to a 20 MHz portion of the BAS band from 1990-

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[15]For example, a 64 level QAM transmission system can support a 27 Mbps bit stream in a channel bandwidth of 6 MHz. Using MPEG II technology, COMSAT and COMSAT Labs believe that a 27 Mbps bit rate will easily support contribution quality video and audio feeds for ENG applications. If the same techniques are used in a 12 MHz channel, the system will support a 54 Mbps bit stream which should be sufficient for contribution quality Advanced Television links.

2010 MHz for MSS uplinks. This band clearing could be accomplished either by retuning the seven BAS channels as COMSAT proposed in its Comments or by simply allowing the first BAS channel to go dark when the first MSS system is in orbit. To facilitate this initial MSS allocation, as part of the Order adopted in this proceeding, the Commission should impose a moratorium on issuing new licenses for BAS in the 1990-2010 MHz band. In Phase Two, and assuming that progress is made at WRC-95, the Commission would permit a gradual clearing of the BAS band up to 2025 MHz as part of the broadcasters' natural migration to digital technologies.[16]

We believe that our alternative plan serves the public interest in several ways. First, as described above, it permits global MSS to access the 2 GHz band without paying a substantial premium to relocate existing users. Second, it enables broadcasters to make a gradual transition directly to new digital technologies and to bypass any significant interim analog equipment modifications. Third, the emphasis on moving broadcasters to digital technology will allow the broadcasters to offer improved services to consumers in the video-to-home market. In sum, as the Commission emphasized in response to a recent inquiry from the Senate, encouraging the broadcast industry to move to digital transmission is in the public interest because "it

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[16]Also, we note -- but do not comment upon -- broadcast industry efforts to identify and obtain usable spectrum in other bands for ENG purposes, possibly in spectrum relinquished by the U.S. government. See, e.g., Comments of AMSTV at 17.

will free up a significant amount of spectrum and create a whole new generation of broadcast and other services."[17]

Finally, we note that MSS support for a reduction in BAS bandwidth and a movement to spectrally efficient digital technologies sometime after 2000 appears to be consistent with the current thinking at the Commission. At Chairman Hundt's direction, the Commission is revisiting the agency's 1992 decision requiring broadcasters to transition from analog to digital technology in 15 years. Apparently, the Commission plans to seek comment on whether, "given the rapid advancement in technologies, the transition period [to digital ATV] should be shortened."[18] These recent statements by the Commission suggest that the broadcast industry can no longer rely on spectrally inefficient analog technology and must move more rapidly to embrace digital technology in the near term.

IV. THE FCC SHOULD PURSUE ITS PROPOSED MSS BAND EXTENSIONS AT WRC-95 AND ENSURE THAT THE NEW BANDS ARE USABLE GLOBALLY AT THE EARLIEST POSSIBLE DATE

COMSAT supports the Commission's proposal in the NPRM to obtain additional global spectrum for MSS uplink and downlink operations at 2010-2025 MHz and 2165-2170 MHz, respectively so as to secure a total of 35 MHz of bandwidth in each direction for global MSS operations. See NPRM at 5. COMSAT firmly believes that the MSS industry cannot achieve its full, competitive potential without securing additional

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[17]Letter to the Honorable J. Robert Kerrey, U.S. Senate, from Robert M. Pepper, OPP, dated May 5, 1995.

[18]Id.

MSS spectrum. Consequently, we support efforts by the U.S. delegation to obtain these new, global MSS bands at WRC-95 in a manner that recognizes the international ramifications and technical complexities of the issue and, thereby, maximizes the prospects for success. In our view, this entails a broad and cooperative effort at the international level with the other countries that have a stake in the current and future use of the proposed new bands. If it should ultimately prove infeasible to gain agreement at WRC-95 for global use of the band extensions, the United States should make every effort to obtain region 2 MSS status for 2010-25 MHz, which would greatly benefit efforts to avoid "mutual exclusivity."

As we indicated in our Comments, the 2 GHz MSS band extensions would compensate for the loss of portions of the global MSS WARC-92 bands which were allocated in the United States by the Commission to terrestrial PCS service after WARC-92. Also, the new bands would help accommodate the expected demand for, and growth in, global and regional MSS. In the Report of WRC-95 Informal Working Group 3 it was estimated that global MSS would grow from serving 3-4 million subscribers by 2002, to serve 8-13 million subscribers by 2005 and 22-37 million subscribers by 2010.[19] We note that the MSS community firmly supports the proposed MSS band extensions for the reasons cited here. See, e.g., Comments of Loral at 3-6.

Regarding the availability of the proposed new MSS bands, we note that the NPRM does not propose a date when these bands should become

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[19]MSS Above 1 GHz Informal Working Group 3 Report, April 14, 1995.

available for international use or when they might become available in the United States. In the Final Report on WRC-95, the Commission maintained its commitment to a 1996 access date for U.S. MSS systems operating in the WARC-92 MSS bands, but refrained from proposing to advance the date for global MSS access to 2 GHz spectrum. No mention was made regarding a proposed date of access for the MSS band extensions. We anticipate that many countries at WRC-95 will advocate a date of global availability around the year 2000 for the WARC-92 bands to support competing global MSS systems. Therefore, it seems reasonable to us that the Commission would support a 2000 or earlier access date for the WARC-92 worldwide MSS bands and ultimately could support an even earlier date of access for the MSS band extensions at least in Region 2.

Additional work must be done in this proceeding, and at WRC-95, to make the proposed new bands usable to the MSS industry on economically feasible terms. To some extent, the proposed new MSS bands represent an extension of the problems being encountered in the United States and in other countries due to existing operations in the 2 GHz band and the lack of an agreed to transition plan to deal with the problems associated with MSS using these bands. At a minimum, we believe it is essential that WRC-95 reach agreement on the need to conduct the necessary studies in the ITU-R to devise a transition plan which will minimize any negative impact on existing users in the proposed MSS extension bands.

Because COMSAT feels so strongly about the need for MSS spectrum to support competing global systems -- and we and other I-CO

owners are investing large sums of money in a global system that would use the 2 GHz band -- we are anxious to work with the Commission and the U.S. delegation to the WRC-95 to plan a strategy in close coordination with other countries which will succeed in allocating the proposed extended bands to MSS and in making these bands usable for MSS systems at the earliest possible date. We look forward to working with the Commission to achieve these results.

V. AUCTIONS ARE NOT APPROPRIATE FOR LICENSING GLOBAL MSS SYSTEMS

The comments of the MSS community were unanimous in their rejection of competitive bidding as a means for licensing global MSS systems at 2 GHz within the United States. Eleven separate satellite interests, including eight potential 2 GHz satellite operators and three satellite and equipment manufacturers, filed comments strongly opposing the Commission's tentative proposal to auction systems at 2 GHz.[20] The objections raised by the MSS community are based on significant legal, financial and policy concerns surrounding the Commission's auction proposal.

As indicated in the comments, the Commission is required by Section 309(j)(6) of the Communications Act to adopt licensing rules which avoid mutual exclusivity, particularly in the context of authorizing new satellite services. See Comments of Motorola at 26-27; Teledesic at 10-13. As far as COMSAT can ascertain, the

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[20]See Comments of TRW at 18-24; Loral at 25-28; Iridium at 1; PCSAT at 11-14; Constellation at 4; Celsat at 19-20; Teledesic at 10-14; COMSAT at 24-32; Hughes at 2-4; GE Americom at 13-20; Motorola at 24-27.

telecommunications legislation now under consideration in Congress continues to require mutual exclusivity as a basic threshold for awarding spectrum licenses by auction.[21] Moreover, the current legislative proposals do not appear to alter the statutory requirement that the FCC utilize alternative "engineering solutions, negotiation, threshold qualifications, and other means" to avoid mutual exclusivity. 47 U.S.C. § 309(j)(6). Given these statutory requirements -- and the fact that the Commission has yet to accept any applications for filing in the 2 GHz bands -- the Commission at this early stage lacks the legal authority to conclude that it will award MSS licenses at 2 GHz by competitive bidding.

On the financial side, numerous MSS interests expressed concern that the costs of bidding for MSS spectrum, particularly if other countries follow suit and if MSS must also pay relocation expenses to existing 2 GHz services, will cripple the nascent MSS industry. See Comments of PCSAT at 12-14; Motorola at 24-25. The MSS parties also demonstrated that it would be difficult to value global MSS spectrum and to bid for MSS licenses on a geographic basis as occurred in the domestic PCS auctions. See Comments of Loral at 25-27; COMSAT at 29-30. MSS parties further indicated concern that foreign jurisdictions may implement auctions in a discriminatory manner and, thus, threaten the financial success of certain MSS systems. See, e.g., Comments of Teledesic at 12-13.

MSS interests also expressed significant policy concerns

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[21] See, e.g., Amendment No. 1256 by Senator Stevens to S.652, as passed by the Senate on June 7, 1995.